



State of Wisconsin \ **GROUNDWATER COORDINATING COUNCIL**

Jim Doyle, Governor

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# **Joint Solicitation for Groundwater Research & Monitoring Proposals**

**For FY 2010  
(July 1, 2009 – June 30, 2010)**

**Facilitated by:  
Wisconsin Groundwater Coordinating Council  
University of Wisconsin Water Resources Institute**

**Participating agencies:  
University of Wisconsin System  
Wisconsin Department of Natural Resources  
Wisconsin Department of Agriculture, Trade & Consumer Protection  
Wisconsin Department of Commerce**

**Proposal Submission Deadline: November 17, 2008**

Contact James Hurley, Water Resources Institute ([hurley@aqua.wisc.edu](mailto:hurley@aqua.wisc.edu)) or Jeff Helmuth, WDNR ([jeffrey.helmuth@wisconsin.gov](mailto:jeffrey.helmuth@wisconsin.gov)) if you have questions or wish to be removed from the mailing list for this annual solicitation.



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To: Interested Researchers  
From: Todd Ambs, Groundwater Coordinating Council  
Date: September 30, 2008  
Subject: Joint Solicitation for Groundwater Research and Monitoring

Todd Ambs  
Council Chair  
DNR

James Robertson  
WGNHS

Enclosed is information on the State of Wisconsin Groundwater Research and Monitoring Program's joint solicitation for project proposals related to groundwater, pesticides, and/or on-site wastewater treatment for funding in the fiscal year 2010 (FY 10) beginning July 1, 2009.

Henry Anderson, MD  
DHS

Anders Andren  
UWS

The solicitation is a coordinated effort of the University of Wisconsin System (UWS), the Wisconsin Departments of Natural Resources (DNR), Agriculture, Trade and Consumer Protection (DATCP), and Commerce. This cooperative solicitation allows interested individuals to prepare project proposals that can be submitted to several different funding sources simultaneously and eliminates the need to submit similar proposals several times for different solicitation efforts. Up to \$440,000 will be available for new monitoring and/or research to meet specific agency needs and objectives in FY 10.

Berni Mattsson  
COMMERCE

Dan Scudder  
DOT

Kathy Pielsticker  
DATCP

The UWS and the state agencies have prepared guidelines on the specific priorities for monitoring and/or research and other pertinent information relative to their request for proposals. You are invited to review the enclosed materials and decide if you wish to submit proposals. **The deadline for submittals is Monday, November 17, 2008.** Investigators are required to submit proposals using *iPropose*, a web-based proposal submission system that will open for registration on Monday, October 20, 2008. Please visit the UW Water Resources Institute website (<http://wri.wisc.edu>) for more information.

George Kraft  
GOVERNOR'S REP.

It is our intent that this joint solicitation will make it easier for interested researchers to prepare proposals, promote coordination among state agencies and researchers, and enhance the ability of state agencies to meet their objectives.

# **FY 10 Joint Solicitation for Groundwater Research and Monitoring Proposals**

**September 2008**

The University of Wisconsin System (UWS) and the Wisconsin Departments of Natural Resources (DNR), Agriculture, Trade, and Consumer Protection (DATCP), and Commerce annually participate in a joint solicitation for research and monitoring proposals dealing with groundwater, pesticides and/or onsite wastewater treatment systems. Up to \$440,000 will be available for groundwater-related monitoring and research in fiscal year 2010 (FY 10) for new projects. The four programs, which are collectively called the Wisconsin Groundwater Research and Monitoring Program (WGRMP), are summarized as follows:

1. UWS Groundwater Research - The UWS, through its UW-Madison Water Resources Institute (WRI), has received funding since FY 90 for groundwater research. Projects may be of a fundamental or applied nature on selected aspects of groundwater research in the natural sciences, engineering, social sciences, or law. Through FY 08, the UWS has invested \$5.6 million on 156 groundwater research projects. Several projects have been co-funded with DNR, Commerce and/or DATCP and 11 were co-funded through the National Institutes for Water Resources program (US Geological Survey). The UWS will have \$250,000 to fund new projects in FY 10.
2. DNR Groundwater Monitoring and Research - The DNR has been funding groundwater "management practice monitoring" projects since FY 86. The intent of these studies, funded through the Groundwater Account of the Environmental Fund, was to identify appropriate management practices to reduce the impacts of potential sources of contamination. In recent years, the DNR has used funds from alternative state and federal sources, and has targeted funds at specific issues of concern, including arsenic, emerging contaminants (viruses, antibiotics), and groundwater quantity. Through FY 08, the DNR has spent approximately \$6.7 million on 203 monitoring projects. Several of these projects have been co-funded with DATCP, Commerce and/or UWS. The DNR anticipates having up to \$190,000 to support groundwater research and monitoring studies in FY10.
3. DATCP Pesticide Research - From 1989 to 2002, DATCP had approximately \$135,000 available annually to fund research on pesticide issues of regulatory importance. This money came from fees paid by pesticide manufacturers to sell products in Wisconsin. Through FY 08, DATCP has spent about \$1.8 million on 42 pesticide projects. Some of these projects were co-funded with DNR and/or UWS. Due to budget constraints, DATCP will not have money to fund any new projects in FY 10. DATCP will, however, take part in the proposal review process.
4. Department of Commerce Private Onsite Wastewater Treatment System Research – The Division of Safety & Buildings (formerly in the Department of Industry, Labor, and Human Relations) received an annual appropriation of \$50,000 from 1990 to 1993 to fund research on alternatives to current private sewage-system technology. In 1994, when the appropriation expired, \$75,000 generated through plan review and licensing fees became available each year for research on private sewage systems. Through FY 08, Commerce has spent approximately \$600,000 on eight projects. Two projects were co-funded with DNR and UWS. Due to budget shortfalls, Commerce will not have money to fund research projects in FY 10. Commerce will, however, take part in the proposal review process.

The Wisconsin Groundwater Coordinating Council (GCC) provides consistency and coordination among the four state agencies in funding groundwater monitoring and research to meet state agency needs. See the "Research and Monitoring" page on the GCC website: <http://dnr.wi.gov/org/water/dwg/gcc/index.htm>. The reasons for this solicitation to be made jointly are to:

- Facilitate proposal writing
- Streamline the review process
- Curtail duplication
- Improve coordination among agencies and researchers
- Enhance communication among the agencies and among principal investigators (PIs)

Joint funding of some projects may be appropriate, but joint funding is not the purpose of this solicitation because each agency has its own designated mission and priorities. Although all proposals received will be distributed to each agency, each investigator is asked to identify the agency whose mission and priorities best match their project.

Please read the solicitation carefully; it contains a description of the priorities for each agency program and other pertinent information, including the online proposal submission process. Capital items may not be purchased with these funds. Generally, faculty salaries plus fringe benefits should not exceed 10% of an individual grant.

Investigators who are new to this program are encouraged to solicit an example proposal from the agency contacts listed below.

If you have questions please call the following appropriate agency contacts.

**James Hurley**, UW Water Resources Institute: (608) 262-0905; [hurley@aqua.wisc.edu](mailto:hurley@aqua.wisc.edu)

**Jeff Helmuth**, Dept. of Natural Resources: (608) 266-5234; [jeffrey.helmuth@wisconsin.gov](mailto:jeffrey.helmuth@wisconsin.gov)

**Jeff Postle**, Dept. of Agriculture, Trade and Consumer Protection: (608) 224-4503;  
[jeff.postle@wisconsin.gov](mailto:jeff.postle@wisconsin.gov)

**Harold Stanlick**, Department of Commerce: (262) 521-5065; [hstanlick@commerce.state.wi.us](mailto:hstanlick@commerce.state.wi.us)

## **Eligibility**

Please note that each agency has separate requirements for eligibility. Review the agency-specific sections carefully. In general:

- UWS:** Funds are restricted for use by faculty within the UW System or by academic staff who have achieved nomination to Principal Investigator status.
- DNR & Commerce:** Funds are restricted to use by UW System and state and county agency contractors.
- DATCP:** Any college or university, research foundation or individual having a demonstrated capacity in pesticide or other applicable research may submit proposals.

Investigators who are not affiliated with the state and therefore not eligible for funding by UWS, DNR, or Commerce may wish to collaborate on a proposal with a UWS investigator or state agency staff member.

Principal investigators that are significantly overdue with completed final reports to this program will not be eligible for new funding. In the case of UWS, reports are considered significantly overdue six months after the initially specified or understood completion dates. The GCC may consider extenuating circumstances on a case-by-case basis.

## Submission of Proposals

Proposals for the Wisconsin Groundwater Research and Monitoring Program (WGRMP) will be submitted via the University of Wisconsin Water Resources Institute's (WRI) website at <http://wri.wisc.edu>. The website will open for registration and submittal of proposals on October 20, 2008. **The deadline for submittal of proposals is 5:00 pm Monday, November 17, 2008.**

Investigators will be required to provide the following information when submitting proposals:

1. An abstract, list of investigators, location of the research, targeted agencies, three to five suggested reviewers and their areas of expertise (two of the reviewers suggested must be from outside of Wisconsin), the name of the department and the administrator(s) responsible for financial management of the project if funded.
2. A proposal narrative in Adobe Portable Document File (PDF) format. A template for the proposal narrative will be available for download from the WRI website in both Microsoft Word and WordPerfect formats
3. A budget spreadsheet in Microsoft Excel format. A template for the budget spreadsheet will be available for download from the WRI website in Microsoft Excel format.
4. An administrative authorization form with signatures of individuals authorized to sign proposal submissions.

To create a PDF file, investigators may use the online or the desktop version of Adobe Acrobat software. Adobe online offers a monthly subscription service for creating PDF files and a free trial subscription to create 5 PDF files. Visit <https://createpdf.adobe.com> for more information.

Proposals should be no longer than 18 pages. All pages should be 8.5" x 11". The project summary, narrative, curriculum vitae, and support pages should each start on a new page, have at least 1.5 line spacing (except for Figure and Table legends), and use no smaller than 11-point type. All margins should be no less than 0.75 inches. The proposal must be consecutively paginated on the bottom of the page. Include literature citations in the proposal where appropriate (single-spaced within, double-spaced between). Any section of a proposal that exceeds the specified maximum page limits will be grounds for returning the proposal to the author.

*Guidelines for Proposal Submission* begin on page 8 and a checklist is available for download on the WRI website. All proposals must be submitted using these instructions. No facsimiles of proposals and no hand-written proposals will be accepted. Special attachments (maps, brochures, etc.) will be accepted, noted, and kept on file, but will not be included in the package of materials submitted to reviewers.

## Review of Proposals

All proposals received through the WGRMP joint solicitation process receive reviews from the following four groups:

1. External peer review: The UW WRI solicits a minimum of four external peer reviews of all proposals.
2. The Research and Monitoring & Data Management Subcommittees of the GCC
3. The Groundwater Research Advisory Council
4. Staff from the funding agencies

The two most important considerations of the reviewers are 1) whether the proposal meets agency priorities as outlined in this solicitation and 2) whether the proposal is well written and scientifically sound. Other criteria include:

- project cost
- proposed timeline
- whether the proposed project methodology meets the stated objectives
- whether the resources requested are adequate to carry out the project
- whether the project investigators have the abilities to complete the proposed project
- if applicable, how the proposed project relates to past WGRMP-funded projects and how it may extend our knowledge

Additional review criteria may be applied by individual agencies (see pages 13-20 for detail).

**Funding decisions will be made by the end of March 2009.** Proposals that are not chosen for funding through this solicitation may be referred to other funding sources for their consideration with permission of the investigators. Likewise, other funding organizations may refer proposals to the funding agencies involved in this solicitation.

## Administration of Projects

Proposals that are funded become the property of the granting Wisconsin state agency. Please note that each agency has separate mechanisms for administering funds, and separate requirements for reporting. However, all investigators will be asked to submit a two-page Project Summary upon completion of the project and to make a copy of the final report available to the WRI Library. For more information, please contact Jeff Helmuth or James Hurley.

## Dissemination of Project Findings

Final reports are required for each project funded through this solicitation. Reports from UWS-funded projects are kept in the UW-Madison Water Resources Library. DATCP, Commerce, and DNR funded reports are kept on file with the respective agencies, but many are provided to the Water Resources Library for public distribution. All project investigators must submit a two-page Project Summary upon completion of the final report. The summaries and final reports are made available on the WRI web site as they become available ([www.wri.wisc.edu](http://www.wri.wisc.edu)), thus providing the public with a real-time link to information about current groundwater research. Multiple-year projects funded through UWS are also required to submit concise annual reports through iPRO, an online interactive project management database hosted on the WRI website. Projects funded by DNR, DATCP, and Commerce are required to submit brief quarterly reports in lieu of the annual report.

Wisconsin's Water Library catalogs all WRI research reports into WorldCat and MadCat, two library indexing tools that provide worldwide access to the research. By having this information permanently indexed, the results are easily available to other scientists, policy makers, and stakeholders. The Water Resources Library has also partnered with The UW Digital Collections Center to digitize and post final reports. Full-text reports are available in the Ecology and Natural Resources Digital Collection (<http://digital.library.wisc.edu/1711.dl/EcoNatRes.Groundwater>).

## Guidelines for Proposal Submission

Investigators are required to submit proposals using *iPropose* (a web-based proposal submission system developed by the UW Aquatic Sciences Center). **The deadline for submission is 5:00 p.m. (Central Standard Time) on Monday, November 17, 2008.** The submission system will open on October 20, 2008 and is located on the UW Water Resources Institute website (<http://wri.wisc.edu>).

The steps for entering information and uploading a proposal are relatively simple. The overall proposal format is identical to previous years, and a checklist is available for download on the WRI website. There are eight steps in the proposal assembly process, and we recommend that investigators concentrate on step one and step two prior to submitting online:

**STEP 1: Prepare full proposal.** Please use the Microsoft Word or Corel WordPerfect templates that can be downloaded from the UW Water Resources Institute website (<http://wri.wisc.edu>). The proposal will consist of the following items:

- A. Title, Investigators, Affiliations of Investigators (top of first page)
- B. Project Summary (begin on same page; **not to exceed 2 pages**; minimum of 11 point font and 1.5 line spacing)
  1. Specific groundwater or related problem addressed by research/monitoring proposal.
  2. What will findings contribute to problem solution or understanding?
  3. Project objectives.
  4. Project approach to achieve objectives, including methods and procedures.
  5. Potential users of project findings.
- C. Proposal Narrative (begin on new page; **not to exceed 10 pages**; minimum of 11 point font and 1.5 line spacing)
  1. Objectives
  2. Background information describing prior research/monitoring relevant to objectives and, if applicable, relationships to other projects funded through the Wisconsin Groundwater Research & Monitoring Program (WGRMP); references to ongoing projects and how they relate to proposed investigation; information gaps that will be filled by the proposed project.
  3. Project plan outlining experimental design and schedule.
  4. Methods detailed enough to convince the reviewer that the investigators are up-to-date on modern techniques; a general statement alluding to techniques is not acceptable.
  5. Relevance to groundwater related problems and agency priorities.

6. Citations
  7. Training support (if any) provided by the project and information dissemination plan.
- D. Curriculum Vitae of Principal Investigators (begin on new page; **not to exceed 4 pages total**). Provide curriculum vitae (including recent publications) for each investigator and state the percentage of time that each will spend on the project (whether funding is requested for that individual or not).
- E. Current or Pending Support (begin on new page; **not to exceed 2 pages**).

After the full proposal is prepared, convert it to Adobe PDF format and save it on your local computer or network. When you submit your proposal package online you will be uploading this PDF file. The system requires that the proposal be in Adobe Acrobat PDF format (.pdf).

**STEP 2: Prepare budget information.** Please use the Microsoft Excel budget spreadsheet that can be downloaded from the UW Water Resources Institute website (<http://wri.wisc.edu>). The budget will consist of the following items:

- A. Salaries and Wages.
- B. Fringe Benefits.
- C. Tuition Remission Charges (if applicable).
- D. Supplies and Publication Costs (list office, lab, computer and field supplies separately).
- E. Travel (to support field operations only; travel for meetings is excluded due to limited funding).
- F. Other Costs (e.g., equipment maintenance and fabrication, subcontracts, rentals, etc.).

**Please note:** At the point of submission, the funding source should be considered State of Wisconsin General Program Revenue (GPR) funds. *Campus indirect costs do not apply.* In the event a proposal from a UW System campus is selected for funding by the Department of Natural Resources (DNR), Department of Commerce, or Department of Agriculture, Trade & Consumer Protection (DATCP), the budget may need to be revised to include the campus' indirect costs, depending on the source of the funding the agency uses to fund the proposal.

Save the Excel budget file on your local computer or network as you work on it. When you submit your proposal package online you will be uploading this Excel file. The system requires that the budget be in Excel format (.xls).

**STEP 3: Create an *iPropose* account.** Developed by the UW Aquatic Sciences Center, *iPropose* is a user-friendly web tool for submitting your proposal. Investigators must register online (<https://aqua.wisc.edu/iPropose>) before submitting proposals. **Note:** *iPropose* will open for registration and submission on October 20, 2008. Instructions on the site will assist you in entering your proposal package.

Steps Four through Six (below) may be completed separately. *You do NOT need to upload your entire proposal package in a single session.* Your account will remain active through the submission deadline (5 p.m. November 17<sup>th</sup>), and you may edit each section until your proposal is officially submitted (see Step 7). **Note:** Your proposal is not officially submitted until you click on the “Submit Proposal” button.

**STEP 4: Enter information about your proposal into the online system:**

- A. Title
- B. Abstract (condensed version of project summary (300 words maximum). It is recommended that the abstract is prepared in a word processing program, saved locally and then copied and pasted into the online form. This suggestion is for your protection in case there were problems with your submission.
- C. Location of field research.
- D. Principal and associate investigators.
- E. Ranking of agencies in order of preference or relevance for funding: University of Wisconsin System, DNR, DATCP and Commerce. (Note that this ranking does not exclude consideration of a proposal by any of the agencies, but it does assist the reviewers in evaluating the proposal.)
- F. The name of at least one financial contact and the department/entity where project will be administered if approved for funding.
- G. Names and email addresses of three qualified reviewers, including their areas of expertise (two of the reviewers must be from outside Wisconsin).

**STEP 5: Upload the proposal PDF file into the online system.** This is the file that you prepared in Step One.

**STEP 6: Upload the budget information Excel file into the online system.** This is the file that you prepared in Step Two.

**STEP 7: Submit your proposal.** Please review the accuracy of the information provided before submitting your proposal. To formally submit your proposal package, select the “Submit Proposal” button at the bottom of your screen. **This step MUST be done by 5:00 p.m. CST Monday, November 17, 2008.**

**STEP 8: Provide proof of administrative approval.** Your submission is not complete until you provide official administrative approval to the Water Resources Institute. Authorization forms are due by 5:00 p.m. Monday, November 17, 2008. Your proposal will not be considered for funding without an appropriate authorization form on file. A fill-able PDF form (WRI Proposal Transmittal/Authorization form) can be downloaded from the UW Water Resources Institute website (<http://wri.wisc.edu>). A substitute form can be used in place of the WRI form as long as it has the required administrative approvals for proposal submission.

**The authorization forms need to be delivered, scanned and emailed, or faxed to Dan Marklein, (address 264 Goodnight Hall, 1975 Willow Drive, Madison, WI 53706; email [marklein@aqu.wisc.edu](mailto:marklein@aqu.wisc.edu); fax (608) 890-1125) no later than 5:00 p.m. Monday, November 17, 2008.**

**UNIVERSITY OF WISCONSIN SYSTEM PROJECTS FUNDED  
THROUGH THE GROUNDWATER RESEARCH ADVISORY COUNCIL**

The University of Wisconsin System (UWS), through its Water Resources Institute (WRI) and its Groundwater Research Advisory Council (GRAC), seeks projects of a fundamental or applied nature on any aspect of groundwater research in the natural sciences, engineering, social sciences, economics, or law. For the purposes of this solicitation, “groundwater research” is defined as research that advances the understanding, protection or management of the groundwater resource. Projects that are primarily focused on wastewater or drinking water treatment technologies, surface water protection or soil science must make a clear link to current groundwater science. Projects funded in the current cycle are listed on the WRI website at <http://wri.wisc.edu>. The UWS will have up to \$250,000 to fund new projects in FY 10. Because the cost of fringe benefits will affect the amount of money available, the exact level of funding depends on the budgeted categories used in the selected proposals. The remaining funds for UWS groundwater research have been previously committed to ongoing projects.

Applicant Requirements: Most often the PI will be a faculty member on any campus in the UWS. However, academic staff members who have achieved nomination to PI status by endorsement of their relevant academic dean may serve in this capacity. Projects that appear to be continuations of previously funded projects with two years of UWS support and projects that have been twice rejected will not be considered. The UWS also strives to avoid funding situations where the name of a PI or co-PI appears on more than two UWS projects during any given fiscal year.

Budget Considerations: Projects will not be approved in any one budget cycle for a period of more than two years and then contingent on satisfactory progress. No capital equipment (more than \$5,000 per item) may be purchased. Travel for attendance at scientific meetings will not be accepted. Generally, faculty salaries and fringe benefits to be paid from any project should not exceed 10 percent of the total individual grant. Overhead costs are not allowed. Supplies should not exceed 20 percent of the total individual grant.

Review of Proposals: Two types of peer reviews will be conducted for proposals submitted for UWS consideration. First, WRI participates in the external peer review process for the Joint Solicitation. Reviews are solicited from national and international experts in the field, with a focus on the technical merits of the proposal. Second, a research subcommittee of the GCC assembles a panel of state experts to evaluate each proposal’s mission relevancy and consistency with UWS priorities.

Final Decision Making: The GRAC, which consists of university, state agency, and public representatives, meets as a body to discuss the results of the review process. The GRAC pays close attention to UWS priorities and direct relevance to groundwater issues in their deliberations. The GRAC recommends a priority list of projects that the UWS should strive to fund in accordance with budgetary resources. A suitable UWS Groundwater Research Program is then assembled by the WRI and submitted to the GCC before the Department of Administration can release UWS research funds upon passage of a state budget.

Reporting: All applicants will be notified about the results of the review process by the end of March 2009. Principal Investigators on awarded projects shall submit a progress report at the end of each project year using the Water Resources Institute’s WEB-based reporting application, iPRO. Annual progress reports are due each year in July. A final report and a two-page project summary shall be submitted through the iPRO system within 90 days after the project end date.

## UWS GROUNDWATER RESEARCH PRIORITIES FOR FY10

The UWS Groundwater Research Priorities for Wisconsin were developed by the UW Groundwater Research Advisory Council. The council members have statewide expertise on groundwater research and policy. UWS funding for groundwater research is administered through the UW Water Resources Institute, which is an active member of the National Institutes for Water Resources (NIWR). The National Institutes were established to implement the provisions of the Water Resources Research Act of 1984 (Public Law 98-242) through the collective activities of the 54 member agencies. The 2008 strategic plan for NIWR contains three objectives designed to “provide relevant and timely information that can assist the Nation’s water resource managers in their development and implementation of programs aimed at providing a sustainable water supply.” These national objectives align well with the UWS Groundwater Research Priorities and were used as a framework to organize the list below. This synergy between local and national goals highlights Wisconsin’s leadership in groundwater research and protection. Note: Due to the emerging interest in fossil fuel alternatives, we encourage proposals that focus on the *effects of alternative fuel production and utilization on groundwater resources*.

### **Objective 1: Maintain or enhance *groundwater quantity*.**

- Implications of the Great Lakes Basin Compact for groundwater use, high capacity wells, and the resulting economic impact on Wisconsin and the region.
- Assessments of water availability and the impacts of human water use on groundwater levels, groundwater storage, surface water features, and ecological features.
- Effects of climate variability on groundwater levels, flow patterns, and quantity.
- Impact of land-use practices on groundwater quantity including the effects of agricultural, industrial, municipal, residential, or waste management activities that recharge groundwater.

### **Objective 2: Maintain or enhance *groundwater quality***

- Identification and characterization of chemical and biological pollutants in groundwater systems and their threats to ecosystems and human health, including the type, toxicity, and persistence of degradation products.
- Effects of climate variability on groundwater quality.
- Impact of land-use practices on groundwater quality including the effects of agricultural, industrial, municipal, residential, or waste management activities that contaminate groundwater.
- Interactions of groundwater and surface water including chemical transformations in the hyporheic zone; impacts of groundwater withdrawal on surface waters; influence of groundwater discharge on surface-water quality; and wetland impacts on groundwater.
- Impacts of alternative fuel production and use (including blends) on groundwater quality.

### **Objective 3: Maintain or enhance *groundwater management***

- Investigations into the best methods for optimizing groundwater use for human and environmental needs in Wisconsin, including strategies for long-term management.
- Development & evaluation of tools or protocols for regulatory approval of high-capacity wells.
- Development and use of new technologies for groundwater characterization or management.
- Investigations that examine the controls on pollutant transport in groundwater, including the development or validation of predictive models.
- Economic impact of groundwater use.
- Impacts of contaminated groundwater on Wisconsin families, including human health effects on reproduction, development, and chronic disease; or on economic losses attributable to groundwater contamination.

## WISCONSIN DEPARTMENT OF NATURAL RESOURCES FY 10 GROUNDWATER MONITORING AND RESEARCH PROGRAM

The Wisconsin Department of Natural Resources (DNR) supports monitoring and research on drinking water and groundwater-related topics. Funding for these projects comes from a variety of state and federal sources and supports a wide variety of topics (see DNR's Groundwater Research and Monitoring Web page at <http://dnr.wi.gov/org/water/dwg/gw/research.htm>). Currently, DNR monitoring and research is funded from the following four sources:

1. Management Practice Monitoring is state-supported groundwater monitoring or support activities, such as laboratory technique development or geologic resource characterization, for establishing or improving management practices necessary to meet the state groundwater quality standards of NR 140, Wisconsin Administrative Code.
2. 2003 Wisconsin Act 310 created funding for groundwater quantity monitoring and research related to (a) interaction of groundwater and surface water, (b) characterization of the groundwater resource, and (c) strategies for managing water.
3. Federal support for groundwater monitoring and research may be available through Section 106 Clean Water Act funding. Goals include maintaining groundwater quality standards, identifying impaired groundwater and its causes and sources, and implementing groundwater management programs.
4. Federal funds for groundwater monitoring and research related to protecting public well water may be available through the Wellhead Protection provisions of the Safe Drinking Water Act.

The DNR anticipates having approximately \$190,000 to fund new monitoring and research projects in FY 10 (July 1, 2009, through June 30, 2010). Specific research and monitoring needs are prioritized and listed after the application requirements.

### **Applicant Requirements**

**Eligibility:** Funds are restricted to UWS and state agency contractors. Others may submit proposals if they include a state-affiliated co-PI. The DNR encourages applicants to include a UWS-eligible investigator to maximize funding options.

**Budget Considerations:** Proposals will be considered for a maximum of two years. Contracts will be approved on an annual basis. Project cost will be a factor in selection. Budget items should include personnel costs, supplies, equipment and necessary travel. State funds cannot support indirect costs or the purchase of capital equipment.

**Contractual Requirements:** Projects must meet all departmental requirements and guidelines related to groundwater monitoring wells (installation, documentation and abandonment/filling and sealing), sampling, laboratory analysis and data management. See chapters NR 141 and 149, Wis. Adm. Code, for more information.

**Reporting:** The PI shall submit quarterly project status reports to the DNR project manager within 30 days of the end of each quarter. A final report and a two-page project summary shall be submitted to the project manager within 60 days of the end of the contract period. The final report must contain thorough documentation of methods, all the data collected, and a discussion of how the results of the project can and should be used by decision makers.

## **Review of Proposals**

All proposals will be reviewed and rated by DNR staff and members of the Groundwater Coordinating Council's Research and Monitoring & Data Management subcommittees. Three important criteria in evaluating each proposal are: (1) whether the proposal addresses a priority issue as listed below; (2) whether the proposal addresses an ongoing need as listed below, and (3) whether the project fits one of the four funding categories specified above. Proposals should contain a clear discussion of the expected practical application of the project results. This will help the reviewer understand the importance of the proposed research and will ensure that the researcher designs the project with the practical application of results in mind.

In making final funding decisions, the Bureau of Drinking Water and Groundwater will formulate its recommendations based on input from all project reviewers and available funds. The Director of the DNR's Bureau of Drinking Water and Groundwater will make the final funding decisions.

## **Monitoring and Research Priorities**

The DNR has identified the following priorities for groundwater monitoring and research for FY 10. These are specific ideas for projects for which state groundwater experts see an immediate need. Funding preference will be given to project proposals that address one or more of these priorities.

- 1. Evaluation of Livestock Waste Management Practices for Protection of Groundwater and Drinking Water Wells.** Drinking water wells in Wisconsin have been contaminated by livestock waste. Research is needed to determine effective management practices and site characteristics for livestock waste handling that are protective of drinking water wells and groundwater. Projects should address acute and/or chronic impacts to groundwater from livestock waste management and may focus on one or more of the following:
  - Mechanisms, pathways and timing of movement into groundwater and private drinking water wells
  - Methods for evaluating sites for suitability for livestock waste application
  - Influence of landscape settings
  - New analytical tools (microbial source tracking, isotopic methods, etc.)
  - Methods of assessing the vulnerability of private water supply wells
  - Associated contaminants (bacteria, nitrate, pharmaceuticals, viruses, other pathogens, etc.)
  - Tools/Mapping to help landowners in areas that are susceptible to groundwater contamination determine best management practices
  - Best management practices
  - Influence of climatic effects (droughts, floods, climate change)
  
- 2. Information to Support Implementation of 2003 Wisconsin Act 310.** In May 2004, state statutes were modified, setting new standards and conditions for protection of surface waters as part of the process in evaluating applications for high-capacity wells (see summary at <http://www.legis.state.wi.us/2003/data/acts/03Act310.pdf>). To help implement the new law, the DNR needs additional data and information on the following topics:
  - *Identification and mapping of springs* – DNR is required to review proposed wells that may impact a spring, which is statutorily defined as “an area of concentrated groundwater discharge occurring at the surface of the land that results in a flow of at least one cubic foot per second [cfs] at least 80 percent of the time.” While historic records pertaining to springs have recently been compiled into a single database, current information is

generally lacking throughout the state. DNR is committed to updating the existing springs information. In addition to the basic information collected by DNR, better information about spring hydrology is needed to assess the impacts of high capacity wells on spring flow rates and characterize the susceptibility of certain spring types or size categories to impacts as a result of groundwater drawdown.

- *Impacts of high capacity wells on surface waters* - The DNR is directed to evaluate whether proposed high-capacity wells in the vicinity of certain high-quality surface water resources (Outstanding and Exceptional Resource Waters, trout streams, large springs) will have a significant adverse impact upon those resources. The Groundwater Advisory Committee recommended a scientific approach to expanding groundwater protection areas in its 2007 report (<http://dnr.wi.gov/org/water/dwg/gac/GACFinalReport1207.pdf>, section 2.2.3 p. 15). There is a need to further evaluate the proposed methodology and its specific numerical criteria. Additionally, more information is needed for evaluating proposed wells, including methods for estimating stream flow rates in areas where stream gaging data is sparse, how a reduction in baseflow affects water quality, temperature, fish and other biota, habitat, and how to best evaluate these impacts. There is a need for the development of advanced screening and assessment tools useful in areas where there are significant numbers of both agricultural high-capacity wells and high-quality surface water resources. There is also a need for more surface water/groundwater interaction research (e.g. streambed conductance, recharge area identification, assessment of irrigation practices and consumptive use coefficients for agricultural applications, characterization of wetland and lake hydrology).
- *Predicting cumulative pumping impacts* – The legislation directs the DNR to establish Groundwater Management Areas around Brown and Waukesha counties, where significant drawdown is creating water quality and quantity concerns. The DNR is interested in predicting, evaluating, and mitigating cumulative impacts of pumping on water resources in these areas.
- *Impacts of groundwater withdrawals* – A better understanding of the implications of groundwater use on groundwater quality, quantity and surface waters is needed. Examples include estimates of current and projected water use rates; basin-scale groundwater budgets; impacts of economic factors such as higher grain prices and demand for ethanol, and quantification of environmental, social and economic impacts of groundwater withdrawals.

Other groundwater quantity goals needing support from monitoring and research include:

- Identification of groundwater recharge areas
- Identification of water-dependent environmentally sensitive resources (e.g. calcareous fens)
- Reduced water demand through conservation, reuse and irrigation efficiencies
- Efficient and accurate water use reporting
- Enhancement of natural recharge
- Identification and evaluation of multi-aquifer wells
- Assessing how well construction requirements affect groundwater quantity concerns
- Improved hard surface infiltration technologies

3. **Implementation of Statewide Groundwater Monitoring Strategy.** A GCC-facilitated statewide groundwater monitoring strategy has been incorporated into the DNR Water Division's Monitoring Strategy (<http://dnr.wi.gov/org/water/monitoring/strategy.htm>). Its purpose is to provide a common state and federal agency framework to coordinate groundwater monitoring programs. Modernization of the State Observation Well Network is a key component of the Strategy. Another component of the strategy that needs to be

addressed is taking a comprehensive look at existing data for parameters of concern. Existing databases (Groundwater Retrieval Network, DATCP, Wisconsin Groundwater Center and others) can be evaluated for public, private, and monitoring well data on nitrate, chloride, other major anions and cations, arsenic, radon, VOCs, pesticides, etc.

- 4. Wellhead Protection Implementation.** The DNR has delineated source water areas, mapped potential sources of contamination, and assessed the susceptibility to contamination for all public water wells in Wisconsin. Research is needed to assist communities in the following areas:
  - *Hydrogeologic studies to support characterization of the vulnerability of municipal drinking water systems to viruses and other emerging contaminants* – More information on the occurrence, transport and fate of viruses, pharmaceuticals, personal care products and other emerging contaminants is needed to help understand the threat they pose to drinking water systems, and ways to manage contaminant sources within a source water area.
  - *Land use impacts on the groundwater resource* – A better understanding is needed of the effect of various land uses (e.g., urbanization and agriculture) and management practices (e.g. stormwater) on groundwater quality and quantity. Simple tools should be developed for communities evaluating how land use decisions impact groundwater.
  - *Identifying abandoned wells in wellhead protection areas for filling and sealing* – Open wells can be a conduit for groundwater contamination. There is a need to assess the extent of the problem (e.g., an area-wide pilot project).
- 5. Evaluation of impacts to groundwater by wastewater treatment methods.** The effectiveness of wastewater seepage cells in preventing nitrogen and other contaminants from entering groundwater is poorly understood. There is a need to study these impacts to develop innovative techniques to enhance their effectiveness.
- 6. Protecting groundwater from impacts by stormwater infiltration.** There is a need to study impacts of stormwater infiltration practices within recharge areas and develop innovative techniques to enhance their effectiveness.
- 7. Evaluation of potential virus contamination of groundwater from landspreading of waste.**

### **Ongoing Needs**

The following topics are the result of input by the Research and Monitoring & Data Management subcommittees of the Wisconsin GCC, state agency staff and university researchers. While the department will give precedence to proposals that meet its priorities above, the following needs will be considered.

**Viruses and Other Microbial Contaminants** – Well water monitoring has shown the presence of viruses in public and private groundwater supplies. US EPA's Groundwater Rule will be requiring small public systems to install treatment for microbial control. Private wells in many parts of the state are also at risk. Areas where work is needed most include: 1) evaluation of existing treatment systems effectiveness; 2) development of new treatment system technology that would be effective, feasible for smaller systems, with minimal owner maintenance and chemical use, and easy to install; and 3) adenovirus research - genotypes, affects, routes of exposure, what people are impacted, and drinking water implications.

**Emerging Groundwater Contaminants** – Research is needed to determine whether certain emerging substances (pharmaceuticals, antibiotics and hormones, pesticide breakdown products, viruses prions, and other microbial agents) pose a threat to our groundwater resource and to human health.

**Occurrence of Groundwater Contaminants** – The department needs more information about the extent and causes of elevated nitrate, arsenic, sulfate, total dissolved solids (TDS), low pH, radium, molybdenum, and VOCs from construction and demolition landfills and other water quality problems in order to give advice to homeowners, municipalities and well drilling contractors.

**Health Effects of Groundwater Contaminants** – Research is needed to better characterize the impact of contaminated groundwater on public health. Pathogenic microorganisms, radionuclides, toxic chemicals (both naturally occurring and synthetic) and their metabolites are of interest. In addition, the synergistic impacts of contaminant mixtures are of concern to the department.

**Resource Definition** – The DNR supports studies that propose to better describe the geologic, hydrogeologic and geochemical conditions that affect groundwater quality and quantity in a specific aquifer or area of the state (e.g., contaminant transport in karst areas).

**New Water Treatment Devices** – Technology to treat contaminated water for drinking water purposes is constantly evolving. New technologies need to be evaluated for their effectiveness.

*Contact Jeff Helmuth at (608) 266-5234 for more information if you have questions about the DNR's Groundwater Monitoring and Research Program.*

**DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION**  
**PESTICIDE RESEARCH PROGRAM**  
**RESEARCH GRANT PROGRAM FOR FY 10**  
**SOLICITATION OF APPLICATIONS**

The Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) Pesticide Research Program is administered by the Agricultural Resource Management Division. Due to budget constraints, DATCP will not have money to fund any new projects in FY 10. DATCP will, however, take part in the proposal review process and recommend funding for projects that meet their research objectives. Contact Jeff Postle (608-224-4503) for more information about DATCP research priorities if you intend to submit a pesticide-related proposal to another funding agency. Investigators should note that the focus of the DATCP program is on pesticide and nutrient research, which includes but is not limited to groundwater issues.

**DATCP Research Priorities for FY 10**

**1. Evaluation of Nutrient Management Practices on Water Quality.**

This research should focus on the effects of nitrogen and phosphorus management practices on groundwater or surface water quality, evaluate models for predicting nutrient impacts on water resources, or evaluate the success of nutrient management planning.

**2. Evaluation of the Environmental Fate Investigation Strategies and Remediation Alternatives for Contaminated Soil and Water at Pesticide Spill Sites.**

Research should investigate the degradation and movement of pesticides at spill sites, develop criteria on the need for and appropriate extent of remedial actions, and evaluate various methods for investigation and remediation of contaminated soil and water.

**3. Evaluation of Factors Influencing the Patterns of Groundwater Contamination by Pesticides and Pesticide Metabolites in Wisconsin.**

This topic involves examining factors which influence pesticide leaching to determine areas of the state that are susceptible to groundwater contamination by specific pesticides.

**4. Use Related Monitoring of Pesticides and Pesticide Metabolites in Groundwater.**

This project should study groundwater contamination by field application of pesticides in key environmental settings such as fractured bedrock areas.

**5. Use Related Monitoring of Pesticides in Surface Water and the Effect of Management Practices on Contaminant Levels.**

Projects on this topic should determine the impacts of pesticide use practices on surface water quality and evaluate the ability of various management practices, such as stream setbacks, to reduce contamination.

**6. Evaluation of the Effect of Pesticide Use on Endangered Species and their Habitat.**

This topic should explore how the use of specific pesticides affects the habitat and survival of endangered species in Wisconsin and how alternative pest control methods could reduce problems.

**DEPARTMENT OF COMMERCE  
ON-SITE WASTEWATER TREATMENT RESEARCH OBJECTIVES**

The Department of Commerce supports research focused on the performance of onsite sewage system designs, products, and management practices that can be incorporated into the administrative rules regulating onsite sewage systems. These designs, products, or management practices must be:

- Directed toward protecting public health, groundwater and surface water quality;
- Result in onsite sewage treatment that is consistent with the provisions of the Groundwater Protection Law;
- Be affordable by the average owner of an onsite sewage system; and
- Be practical for the climate and soils of Wisconsin.

The department also intends to monitor, on an ongoing basis, the performance of various on-site sewage system methods and technologies. The purpose of the performance monitoring is to provide additional information on the long-term performance of the various on-site sewage system methods and technologies to confirm their reliability, to provide data for improvements and to monitor long-term compliance with the groundwater standards.

Due to budget constraints, the Department of Commerce will not have money available to fund projects in FY 10. However, the department will actively participate in the review of proposals and make recommendations to the other agencies participating in the solicitation to help meet department priorities.

**Department of Commerce Research Priorities for FY 10**

1. Developing a correlation between dry and wet unit measurements for monitoring treatment in soil absorption units (e.g. fecal count per gram of dry soil versus fecal count in cfu's/100ml).
2. Research on treatment efficiency of traditional septic tank/septic absorption systems.